

Claims

1. Clamping and/or braking device

- a) with a base element (7), which is connected rigidly by means of at least two adjacent wall sections (3) to a force-applying element (17), by means of which the generated clamping and/or braking forces can be transferred to an object (39),
- b) wherein the two or more adjacent wall sections (3) define an essentially sealed pressure chamber that can be pressurized with positive pressure or negative pressure,
- c) wherein the two or more wall sections (3) each have a bending region (3a), which is resistant to tensile force and nevertheless can be bent elastically so that the bending regions (3a) form an elastic element between the base element (7) and the force-applying element (17), and
- d) a predetermined clamping and/or braking force can be exerted on the object (39) by means of the force-applying element (17) in the unpressurized built-in state of the clamping and/or braking device (1), and
- e) wherein the two or more wall sections (3) and their bending regions (3a) are shaped so that when the pressure chamber is pressurized with positive pressure or negative pressure, as a result of a change in the curvature of the bending regions (3a), the clamping and/or braking forces that can be transferred by the force-applying element (17) to the object (39) are changed or the

force-applying element (17) is moved in the direction towards the base element (7) or away from this element.

2. Clamping and/or braking device

- a) with a base element (7) and a force-applying element (17), by means of which the generated clamping and/or braking forces can be transferred to an object (39), as well as at least two adjacent wall sections (3), which each apply force with an end region onto the base element (7) and the force-applying element (17),
- b) wherein the two or more adjacent wall sections (3) define an essentially sealed pressure chamber that can be pressurized with pressure or negative pressure,
- c) wherein the two or more wall sections (3) each have a bending region (3a), which is resistant to tensile force and nevertheless can be bent elastically so that the bending regions (3a) form an elastic element between the base element (7) and the force-applying element (17), and
- d) a predetermined clamping and/or braking force can be exerted on the object (39) by means of the force-applying element (17) in the unpressurized built-in state of the clamping and/or braking device (1), and
- e) wherein the two or more wall sections (3) and their bending regions (3a) are shaped so that when the pressure chamber is pressurized with positive pressure or negative pressure due to a change in the curvature of the bending regions (3a), the clamping and/or braking forces

transferred by the force-applying element (17) to the object (39) are changed or the force-applying element (17) is moved towards the base element (7) or away from this element.

3. Device according to Claim 1 or 2, characterized in that the wall sections (3) and their bending regions (3a) are shaped and dimensioned such that when the pressure chamber is pressurized with positive pressure or negative pressure as a result of an increase of the curvature of the bending regions (3a), the clamping and/or braking forces transferred by the force-applying element (17) to the object (39) are reduced or the force-applying element (17) is moved in the direction towards the base element (7).

4. Device according to one of the preceding claims, characterized in that the bending regions (3a) run essentially parallel in the unpressurized state and preferably have a small spacing, which lies in the range from 0.1 mm to 10 mm, preferably from 1 mm to 5 mm.

5. Device according to one of the preceding claims, characterized in that the wall sections (3) are formed as separate parts and have an attachment region (5), with which the wall sections (3) are connected, preferably pressure-tight, to the base element (7) or the attachment regions (5) are shaped such that they form the base part (7) after being connected to each other, preferably in a pressure-tight way.

6. Device according to Claim 5, characterized in that the wall sections (3) each have an attachment region (15) bent at a right angle in the region of the base element (7) and the

attachment regions (5) are connected preferably in a pressure-tight way to a base element (7), which runs essentially perpendicular to the bending regions (3a) and which preferably comprises a retaining plate.

7. Device according to one of the preceding claims, characterized in that the wall sections (3) are formed as separate parts and have an attachment region (13), with which the wall sections (3) are connected preferably in a pressure-tight way to the force-applying element (17), or the attachment regions (13) are formed such that they form the force-applying element (17) after they are connected to each other preferably in a pressure-tight way.

8. Device according to one of the preceding claims, characterized in that the pressure chamber is sealed at the side regions of the wall sections (3) by means of lateral sealing elements (23), which are connected flush on these wall sections and which preferably consist of plastic or rubber.

9. Device according to one of Claims 5 to 8, characterized in that a spacing and/or sealing element (19, 43) is inserted between the wall sections (3) formed as separate parts in the region of the base element (7) and/or the force-applying element (17).

10. Device according to one of Claims 8 and 9, characterized in that projecting from the base element (7) or force-applying element (17), a retaining arm (25, 27) for the appropriate lateral sealing element (23) extends in the direction towards the force-applying element (17) or

the base element (7), wherein the lateral sealing element (23) is arranged preferably between the lateral end surfaces of the wall sections (3) and the retaining arm (25, 27).

11. Device according to one of the preceding claims, characterized in that the movement path of the bending movement of the bending regions (3a) [of] wall sections (3) is limited by a mechanical stop (45) when pressurized, wherein the stop (45) is preferably connected to the base element (7).

12. Device according to one of the preceding claims, characterized in that several force-applying elements (17) are connected to a base element (7) each by means of two wall sections (3).

13. Device according to one of Claims 1 to 12, characterized in that several pairs of wall sections (3), which each apply force with an end region on the base element (7) and with another end region on the force-applying element, are provided between a base element (7) and a force-applying element (17).

14. Device according to Claim 12 or 13, characterized in that the base element (7) is formed in a ring shape, preferably a circular ring shape.

15. Device according to Claim 12 or 12 and 14, characterized in that the force-applying elements (17) are arranged within the base element (7) and preferably define a circular ring-shaped clamping region.

16. Device according to Claim 13 or 13 and 14, characterized in that the force-applying element (17) is arranged within the base element (7) and is formed as a ring, preferably circular ring shape and/or slotted.

17. Device according to one of Claims 12 to 16, characterized in that the pairs of wall sections (3) each lie in a plane and are closely adjacent.

18. Device according to Claim 17, characterized in that the pairs of wall sections (3) are formed by two wall elements, which are formed as ring-shaped, preferably radially slotted plates and are formed at least in the wall regions between the slots of the bending regions (3a).

19. Device according to Claim 18, characterized in that an attachment region (13), which is connected to the corresponding force-applying element (17) or which forms this element, is provided on each end region of the wall sections (3), and wherein the joining region of the wall elements forms another attachment region (5), which is connected to the base element (7) or forms this element.

20. Device according to one of Claims 12 to 19, characterized in that two ring-shaped sealing elements (49), which form a common pressure chamber for the pairs of wall sections (3), are provided between the wall elements, wherein the sealing elements (49) are held preferably in a sealed way between the attachment regions (5, 13) of the wall elements.

21. Device according to one of Claims 12 to 19, characterized in that a tubular ring element (47), which forms a common pressure chamber for the pairs of wall sections (3), is provided between the bending regions (3a) of the wall elements.

22. Device according to one of Claims 12 to 21, characterized in that a wall element is made from a stack of several partial wall elements preferably formed identically.

23. Device according to one of Claims 12 to 22, characterized in that the base element (7) is formed as an essentially closed, preferably two-part housing, in which the wall elements are received, wherein preferably inner wall sections of the housing limit a maximum bending of the bending regions of the wall sections.

24. Device according to Claim 23, characterized in that the ring-shaped, preferably slotted force-applying element (17) is also held in the housing and guided with reference to its radial dimensional changes.

25. Device according to one of Claims 2 to 24, characterized in that the base element and the force-applying element are connected to each other and formed as a one-piece base (59) with a clamping and/or braking region (63), wherein the two or more wall sections (3) apply force with their end regions on the base in the unpressurized state, such that through elastic deformation of the base by means of the clamping and/or braking region, the clamping and/or braking forces that can be transferred by the force-applying element (17) to the object (39) are

changed or the force-applying element (17) is moved in the direction towards the base element (7) or away from this element.

26. Device according to Claim 25, characterized in that the base (59) is formed in essentially H shape, the clamping and/or braking regions are provided on the essentially parallel limbs of the base on one side of the center connecting piece of the base, and the wall sections are provided between the parallel limbs of the base on the other side of the center connecting piece of the base and apply force on these limbs, wherein the base can be deformed elastically in the region of the center connecting piece or the connecting regions of the center connecting piece to the limbs.

27. Device according to Claim 25, characterized in that the base (59) is formed in an essentially U shape, the clamping and/or braking regions are provided on the essentially parallel limbs of the base, and the wall sections are provided between the parallel limbs of the base and apply force on these limbs, wherein the base can be deformed elastically in the region of the base of the U and/or the limbs of the U-shaped base.